

FALL
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ENVIRONMENTAL BULLETIN

A Maine DEP Informational Bulletin for Maine Citizens & School Officials



Diesel Bus Emissions Prompt School Officials Into Action

School bus exhaust linked to asthma in children

"Asthma rates in New England are among the highest in the nation and diesel exhaust can make things worse," says Robert Varney, Regional Administrator of the US Environmental Protection Agency (EPA).

Numerous scientific and health studies have indicated that exposure to diesel exhaust can pose serious health risks. Children are especially sensitive to air pollution because they breathe 50 percent more air per pound of body weight.

New federal standards will make buses run cleaner in the future. But it will take a long time for fleetwide turn-over.

This year, the New England Asthma Regional Council and EPA New England issued idling guidelines for school bus operators in an effort to reduce diesel emissions that aggravate asthma. By cutting down on bus idling time, students and drivers will breathe cleaner air now.

Although other New England states have adopted anti-idling laws, Maine is relying upon local school systems to adopt strategies to reduce idling and consider other approaches for reducing students' exposure to diesel exhaust.

School managers and bus drivers can reduce exposure of our children to exhaust fumes by reducing idling time and by modifying parking and routing strategies.



Scott Wilson, DEP's Emissions Inspector conducts a diesel exhaust opacity test.

Changes in the way we run our buses can make our safest form of transportation even safer!

There are also several options available to improve the emissions performance of diesel buses: retiring older buses, converting engines to run on cleaner, alternative fuels and retrofitting older engines with modern emission control technologies.

New cleaner running buses will eventually help, but implementing some of these strategies reduces children's exposure to diesel exhaust today.

In this newsletter you will find recommendations from the Maine Departments of Education and Environmental Protection and Maine Association for Pupil Transport.



Recommendations to reduce diesel exhaust

- * Prevent or reduce bus idling whenever practical in the schoolyard and at cold start-up.
- * Require routine maintenance to keep buses running smoothly with no leakage of fumes into seating areas.
- * Examine the length of rides and take appropriate steps to minimize length of routes where possible.
- * Reevaluate location of bus parking lots, avoiding close proximity to areas where fumes can become trapped or enter buildings.
- * Purchase buses with low emission engines and use ultra-low sulfur diesel fuel.

What are Maine schools doing?

Kevin Mallory, Transportation Director for the City of Portland schools, has taken the school bus exhaust problem very seriously. The first thing he did was to create and implement a **No-Idling policy**. He says “**This is a no-cost solution -- it’s a no brainer.**” (See Portland’s sample policy on page 7.)

Kevin recommends that local districts take charge by promoting cleaner school buses and focusing on new technologies when purchasing buses. He says the state should provide incentives in its funding formulas for reimbursement of new and less polluting school buses.



Although ultra-low sulfur diesel fuel burns cleaner, it is still quite expensive. Kevin would like to see a coalition of school systems or the state try to negotiate a bulk purchase of this fuel for schools in order to get a better price.

Other alternative fuel options Kevin is considering for Portland buses are compressed natural gas (CNG) or propane. “Given the available options, I would have a school bus fleet consisting of all CNG or propane vehicles. Although it may cost a little more initially, the technology is a proven winner at reducing air pollution.”

Kevin recommends that the next step after implementing a no-idling policy is to examine your fleet and identify strategies for reducing emissions. Bring the issue to the attention of your Superintendent and School Board for support.

(See www.MaineDEP.com for more information)

ASSESSING YOUR FLEET



- * Evaluate which buses to retire and be replaced with cleaner running engines. Identify which could be retrofitted with advanced emission control technology. Research the options and costs for retrofitting buses that can’t be replaced any time soon.
(See www.epa.gov/otaq/retrofit/retroverifiedlist.htm for retrofit equipment information.)
- * Find out what alternative fuels might be available in your area of the state and whether nearby school systems are willing to bulk purchase. What refueling equipment would be necessary for the fuels you’re interested in?
(See www.afdc.doe.gov/questions.html for information on alternative fuels.)

Get on the Bus...

Reduce Idling for Clean Air

Riding the bus is an extremely safe way to go to and from school. Now state officials want to further protect student health by reducing exposure to harmful exhaust emissions. Diesel exhaust from idling school buses can accumulate on and around the bus. Cutting school bus idling time is good for the air and good for the health of children and drivers. It also saves school budget dollars; every hour of idling wastes one gallon of fuel.

Schools can obtain “no-idling” promotional items from the Maine Department of Environmental Protection (DEP). School Transportation managers can use the driver **pledge card**, sunvisor **tips card** and the “I’m doing my share” dashboard **magnet** to get commitment from drivers and to remind them to turn off the bus.



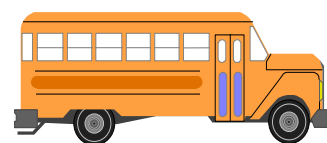
Doing My Share For Clean Air
Turn off buses as soon as
they arrive in the school yard.
Limit idling during morning warm-up.

Show the community that you’re taking action to reduce pollution by expanding your no-idling campaign to include cars and trucks that drop students off in the schoolyard. Students could create posters for promoting the clean air effort and then measure the numbers of drivers that “do their share for clean air.” The school and community could reward drivers with special “thanks” cards to give positive reinforcement to drivers. (See below for an example.) You might even want to award certificates of recognition on a regular basis to those bus drivers who consistently cooperate.

Help is available: School systems that have decided to undertake an anti-idling campaign can use the project as an opportunity to bring clean air issues into the classroom. Groups such as the York and Cumberland County Kids and Transportation Programs, the Maine Energy Education Program and the Maine Stewardship Alliance, can provide class presentations to students that focus on clean air. Contact Maine DEP for contacts in your area.

Thanks!
We appreciate your
help in keeping the
air clean by shutting off
your engine in the schoolyard.

We need your help!
You can help make our
safe buses even safer by
turning off your engine in the
schoolyard to reduce air pollution.



No-Idling Tips

Turn off school bus engines when buses arrive at their destinations, particularly on school grounds.

Do not restart buses until departure.

At school bus depots, try to limit the idling time during early morning warm-up to what is recommended by the manufacturer - generally 3-5 minutes.

In colder months, block heaters, which plug into electrical outlets or Webasto heaters installed in the bus can help warm the engine to avoid starting difficulties and shorten warm-up time.

If buses need the engine to run flashing lights, consider changing the circuit configurations so that the lights can be powered by the battery without the engine running.

In winter, provide an indoor space where drivers who arrive early can wait and keep warm.





Maine DEP is
raising awareness by:

- * providing educational tools for encouraging no-idling programs;
- * presenting and exhibiting at school conferences;
- * developing news bulletins for school officials;
- * creating electronic presentations for school officials;
- * compiling information on costs and benefits of alternative fuels; and
- * promoting fleet assessment and emissions testing.



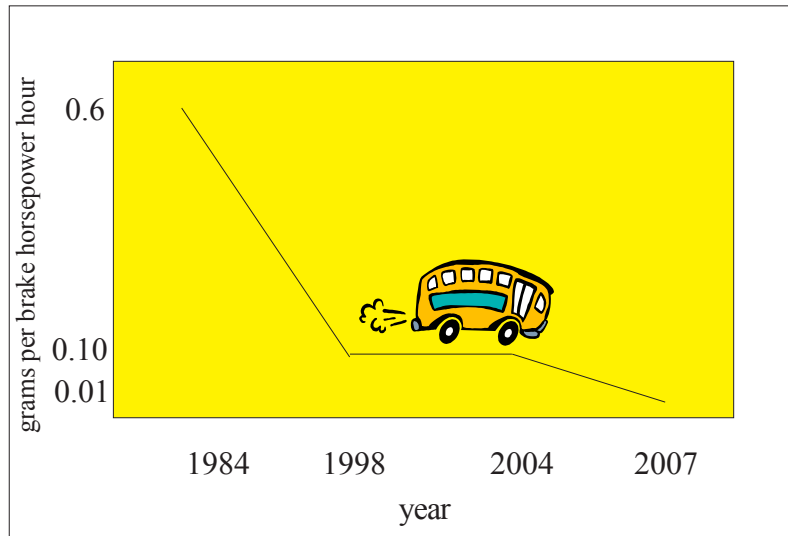
Contact Lynne Cayting
at Maine DEP
for more information
at 287-2437.

What is government doing?

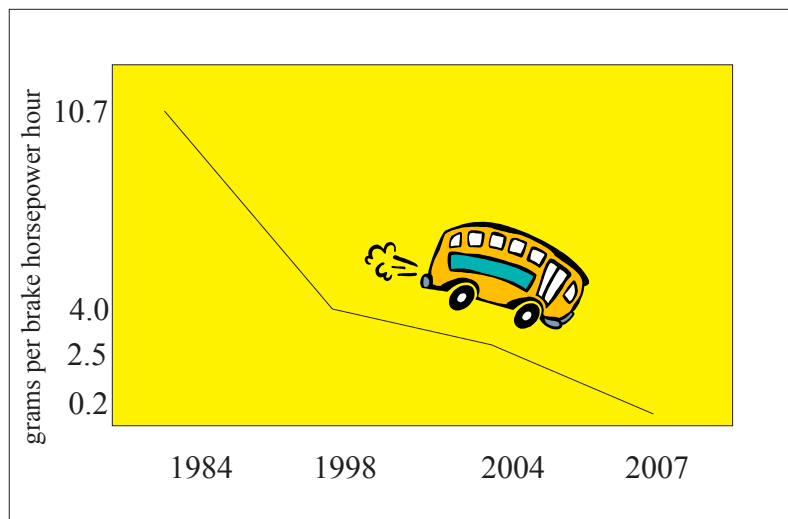
The U.S. Environmental Protection Agency (EPA) and the New England states are taking steps to advance cleaner diesel engine technology. New standards for cleaner engines are in place that will transform diesel fleets over the next decade.

EPA Standards for New Trucks and Buses

Particulate Matter (PM) Emissions



Nitrogen Oxide (NOx) Emissions



In fact, some diesel engines are going to meet the cleaner emission standards starting in 2002.

In the meantime, the federal government is working to encourage the creation of *no-idling programs* and promoting the use of *cleaner fuels* where available.

More emissions reduction options

Emission Control Retrofit Technology

Diesel engines continue to be a durable and economical source of power. **Ultra-low sulfur diesel fuel (ULSD)** can be used to reduce pollution from existing trucks and buses, vehicle owners can use ULSD in combination with pollution control equipment such as particulate matter filters.

Particulate matter (PM) filters cost about \$5,000 and last approximately six years. Using PM filters with ULSD can reduce emissions of PM by 90 percent. However, these filters cannot be used on all buses as they are dependent on the bus operating parameters (e.g. exhaust temperature.)

Oxidation catalysts are another retrofit option. They do not have to be operated with ULSD, cost about \$2500 and last approximately 15 years. However, they do successfully reduce PM emissions by 20-30 percent.

For more information, visit:

www.epa.gov/otaq/retrofit/retroverifiedlist.htm

Alternative Fuels

Biodiesel is a domestically produced, renewable fuel that can be manufactured from new and used vegetable oils and animal fats. Biodiesel is safe, biodegradable, and reduces PM, carbon monoxide, hydrocarbons, and air toxics, but increases emissions of nitrogen oxides. Used in its pure form, biodiesel may require certain engine modifications. Blends of 20% biodiesel with 80% petroleum diesel (B20) can be used in unmodified diesel engines. For more information, visit: www.afdc.doe.gov

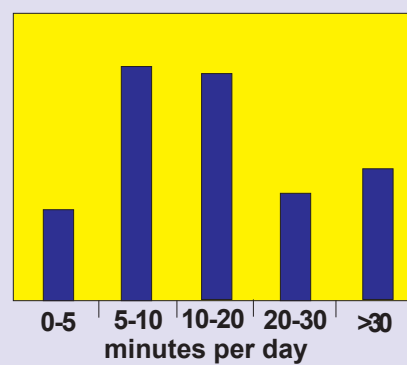
Compressed Natural Gas (CNG) is produced either from gas wells or in conjunction with crude oil production. Vehicles powered by natural gas perform just like vehicles powered by gasoline or diesel fuel, but emit less pollution and require less maintenance. For more information, visit: www.afdc.doe.gov

Propane, or liquefied petroleum gas (LPG), is a popular alternative fuel choice because an infrastructure of pipelines, processing facilities, and storage already exists for its efficient distribution. Propane is used in both light- and medium-duty vehicles. Propane has been used as a transportation fuel around the world for more than 60 years. Maine has propane fueling stations in both Portland and Augusta. For more information, visit: www.afdc.doe.gov

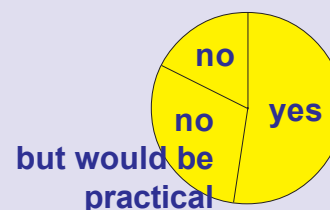
Maine DEP's Idling Survey Results

At the July MAPT meeting, Maine DEP surveyed the members to get a picture of school bus idling in Maine. 113 bus drivers, mechanics and transportation directors from 47 different schools districts responded.

Estimated time a bus idles at school

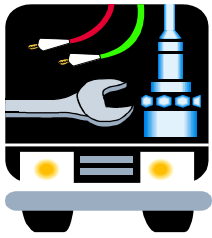


Does your school have no-idling guidelines?



If no-idling isn't practical, why not?





QUESTIONS & ANSWERS about Diesel Engines and Idling



Maine state law requires we run our safety lights but on older buses we need to run our engines for that. What can we do?

According to Harvey Boatman, Maine DOE's specialist on school facilities and pupil transportation, "Most batteries are capable of running the lights without the engine. If yours isn't, you may want to reconfigure the wiring or add an extra battery." The procedure should be very simple. Take the wire which activates the safety blinkers from the ignition terminal and move it to the accessories terminal. If the operator is concerned about restarting and battery drain, he or she can add an additional battery with a battery isolator that keeps one battery fully charged. If there are already two batteries wired in parallel, an isolator can also be added. Many school buses are set up so they do not require the engine to be running to use the safety lights.

What can I do about fogging of windows? This is a real problem in the winter when students climb onto a cold bus.

Dave Brunette, Transportation Director for Brunswick had Webasto heaters included as optional equipment on his new buses. He says, "They're terrific!" A Webasto heater circulates hot water through or around the engine. It eliminates the need for a block heater in the winter. The hot water can also circulate throughout the bus with blowers that keep the bus warm. Of course, power (engine or battery) is needed to run the blowers. The cost is about \$1800 to \$2000. You can find more information on these heaters from your school bus dealer.

How long should I warm up the bus during early morning initial startup?

Most engine manufacturers recommend that newer engines run for roughly 3-5 minutes before driving. In colder climates, block heaters are a good alternative to excessive idling. They plug into electrical outlets and help warm the engine to avoid starting difficulties and reduce idling time during warm-up.

Isn't restarting diesel vehicles a problem in colder weather?

Although engine manufacturers recommend that you let your engine idle for a few minutes after you stop, most newer diesel engines will stay warm for several hours after they've been running, retaining more than enough heat to keep the engine warm and avoid starting difficulties. Older vehicles may have more difficulty restarting, but don't assume new engines should be operated like older ones. Check the manufacturer's recommendations.

Isn't diesel fuel gelling a problem in cold weather?

Gelling of diesel fuel used to be a problem years ago, but refiners have worked to resolve that issue by creating winter blends (diesel and kerosene) that better withstand colder temperatures. You can also purchase fuel additives that will reduce gelling and clean the fuel injectors at the same time. Cleaner fuel injectors help the engine run cleaner as well.

Doesn't starting the engine frequently cause more engine wear and tear and burn more fuel?

Letting an engine idle actually does more damage to the engine than starting and stopping. Running an engine at low speed (idling) causes twice as much wear on internal parts as driving at regular speeds does. Additional wear can increase maintenance costs and shorten the life of the engine. Generally, fuel consumption during engine start-up is equivalent to about 30 seconds of engine idling.



Sample Guidelines from Portland's Public Schools:

In recently published studies regarding how school buses operate, diesel engine fumes in the bus cabin as well as in the outdoor air have been found to be a health hazard to children and employees. While there is debate about acceptable levels and what technologies might alleviate the problem, idling of buses has been identified as a particular cause of the problem.

As a result of these findings and an announcement from the EPA about the serious health hazards from diesel exhaust, our school system is implementing the following policy immediately.

Loading Students: All school buses are prohibited from idling when students are being loaded (does not apply to route stops). When arriving at a school to load students, the driver should see to it that all windows are closed and the engine is shut off. Roof vents can remain open. When loading students, safety lights should be activated without the bus running. The engine shall not be turned on until such time as all students are loaded and the door is securely closed. Windows may not be opened until the vehicle is in motion and has cleared the immediate proximity of the school.

Should you be queued in a line with other buses, no bus driver shall start the engine until all buses are ready to leave. The lead bus in the queue should control movement at all times and other drivers should await the word that buses are ready to move before starting engines.

Should a bus become delayed an excessive amount of time, due to a problem with a student, breakdown, etc., buses are free to maneuver around the vehicle and leave the area at the drivers discretion. The delayed bus should make sure windows and doors are closed while other buses depart. Buses should make sure windows and doors are closed while other buses depart. Buses such as special education buses (who may be ready to leave a school earlier than large route buses) are free to leave anytime after the bus is loaded.

EXCEPTION TO THIS POLICY: Buses will be allowed to idle at schools anytime the temperature falls below 20 degrees, driving windows need defrosting, or an emergency situation dictates.

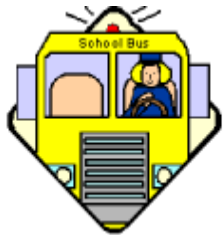
BUS STORAGE YARD: Drivers are prohibited from idling buses in excess of ten minutes. Please shut your bus off when you enter the storage facility. On cold mornings when condensation has frosted windows and extra time is needed to defrost them, drivers will be allowed up to a half-hour idling time in the yard.

Maine DEP would like to recognize all school districts and Transportation Directors that adopt a no-idling policy. Send us a copy of your guidelines to have your name added to the "Doing My Share for Clean Air" list.



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Diesel Bus Emissions Prompt School Officials Into Action

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Survey of Maine Fleet - Checklist of Options Insert

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Superintendents and Transportation Directors

Return the enclosed survey by
November 30, 2002,
to be entered into a
drawing for a chance
to win a.....

\$50.00

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